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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/803,509

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David Spencer Pearson

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ROPES & GRAY LLP

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EXAMINER

CALLAHAN, PAUL E

ART UNIT

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2137

MAIL DATE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/803,509	Applicant(s) PEARSON ET AL.	
	Examiner PAUL CALLAHAN	Art Unit 2137	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 January 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-6 and 14-32 is/are allowed.
- 6) ☒ Claim(s) 7-12 is/are rejected.
- 7) ☒ Claim(s) 13 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>1-14-08</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 1-32 are pending in the instant application and have been examined. This Office Action is directed towards the Applicant's response filed January 7, 2008.

Response to Arguments

2. Applicant's arguments filed January 7, 2008 have been fully considered but they are not fully persuasive.

The Applicant's response has overcome the rejections of claims 1-6 and 14-32.

The Applicant argues in traverse of the rejections of claims 7 -13 under 35 USC Sec. 103(a) as unpatentable over Bennett, Lee and Bass. The Applicant asserts that the combination fails to teach the features of determining multiple paths for end-to-end transport of a secret key across a QKD network. However, the Examiner maintains that Bass does teach the step of selection of the number of nodes that will participate in any session, which reads on multiple paths.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 7-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Bennett and Brassard: Quantum Cryptography: Public Key Distribution and Coin Tossing, International Conference on Computer Systems & Signal Processing, Bangalore India, 10-12 Dec. 1984, Lee, US 5,535,195, and Bass et al., US 4,649,233.

As for claim 7, Bennett teaches a method of transporting a random block of bits in a quantum cryptographic key distribution (QKD) network (page 1, col. 2), comprising: sharing blocks of bits between nodes in a QKD network using quantum cryptographic mechanisms (page 1, col. 2). Bennett does not explicitly teach that the random blocks of bits constitutes a secret key or that the transport is between a source node; and a destination node in the network. However, Lee does teach this features (col. 2 lines 40-50). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate these features into the system of Bennett. Motive to make this combination is found for example in Bennett, page 1 col. 1 where the desirability in using QKD in the distribution of random values is discussed. Random values are used in many instances a session or secret key. Bass teaches the features of the claim not taught by the combination of Bennett and Lee, namely determining multiple paths for end-to-end transport of a secret key across a network; and transporting the secret key across each of the determined multiple paths (col. 6 lines 45-50 where any number of nodes, i.e., multiple paths, can be selected for key transport). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the features of Bass into the system of Bennett and Lee. Motive to make this combination is found for example in Bennett, page 1 col. 1 where the desirability in

using QKD in the secure distribution of random values in a network is discussed

As for claims 8, 9, and 10, the combination of Bennett and Lee do not explicitly teach multiple paths that comprise multiple disjoint paths or multiple paths that comprise multiple, partially disjoint paths. However, Bass does teach this feature (col. 6 lines 45-50 where any number of nodes, i.e., multiple paths, can be selected for key transport). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the features of Bass into the system of Bennett and Lee. Motive to make this combination is found for example in Bennett, page 1 col. 1 where the desirability in using QKD in the secure distribution of random values in a network is discussed.

As for claim 11, Lee teaches the features of the claims not taught by Bennett and Bass: namely determining link metrics associated with quantum cryptographic links of the network and determining multiple paths for transporting the secret keys across network comprises determining the multiple paths based on the determined link metrics (abstract, col. 4 lines 45-67). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate this feature of Lee into the system of Bennett and Bass. It would have been desirable to do so as selection of link metrics in this manner would allow for decreased bandwidth requirements for key transport.

As for claim 12, Bennett teaches exchanging a respective number of secret key bits, in the form of random values, between each node of the QKD network using the QKD techniques (page 1, col. 2).

Allowable Subject Matter

5. Claims 1-11, and 14-32 allowed.
6. Claim 13 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul E. Callahan whose telephone number is (571) 272-3869. The examiner can normally be reached on M-F from 9 to 5.

If attempts to reach the examiner by telephone are unsuccessful, the Examiner's supervisor, Emmanuel Moise, can be reached on (571) 272-3865. The fax phone number for the organization where this application or proceeding is assigned is: (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR.

Art Unit: 2137

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Paul Callahan/
March 27, 2008

/Emmanuel L. Moise/
Supervisory Patent Examiner, Art Unit 2137